SUPERTALENT SUPER NOVA DRIVE DATASHEET

2.5” SATA-III SOLID STATE DRIVE

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1.0 PRODUCT DESCRIPTION

1.1 PRODUCT OVERVIEW

A Solid State Disk (SSD) is a storage device that is based on semiconductors rather than rotating magnetic platters. Most SSDs, including Super Talent's SuperNova Drive offerings, are based on Sync. NAND Flash chips because they are fast, highly reliable, widely available and non-volatile.

SSDs are 100% compatible with standard hard disk drives, and have both industry standard dimensions and a standard hard drive SATA 6Gbps (a.k.a. SATA-III) interface. While typical spinning HDDs are the weakest point when it comes to withstanding extremes in a PC, Server, Workstation, or Datacenter, an SSD drive is often one of the most reliable components in those environments. Along with its durability and reliability, the SSD delivers unparalleled performance and ultra high reliability especially for enterprise server/mass storage market.

1.2 TARGET APPLICATIONS

- Military and Aerospace
- Enterprise Computing and RAID card solution
- Embedded / Industrial Systems
- Notebook
- Medical Industry
- Casino Gaming

1.3 PRODUCT FEATURES

- Capacity: 128GB, 256GB, 512GB (512GB will be available in Q4, 2012)
- Form Factor: 2.5" HD (100.0mm x 69.85mm x 7.0mm)
- MLC Async. NAND Flash
- Fully compliant with SATA revision 3.0
- Integral data security
- User encryption key support
- Native Command Queuing (NCQ) support
- S.M.A.R.T. command transport (SCT) technology
- Rugged Metal Case
- Up to 10 year data retention and Highly durability with DuraWrite™
- Built in wear leveling algorithm and error detection and correction with RAISE™
- **Underfilling Technology for Assembly reliability improvement**
- **Thermally conductive Silicon Pad attached on controller**
- **Designed and Manufactured in KOREA**

- 100% tested HW and SW for Enterprise level of quality and reliability

1.4 SYSTEM REQUIREMENTS

Operating Voltage Requirement: V_{cc} = 5.0V ±10%

Operating System: Supported by all Operating Systems

Interface: SATA 6.0Gbps (SATA-III) or SATA 3.0Gbps (SATA-II) or SATA 1.5Gbps (SATA-I)

Installation Requirements:

- System Mounting Hardware as required
- 15Pin SATA Power cable
- 7Pin SATA Data cable

2.0 PRODUCT ORDERING PART NUMBERS

2.1 ORDERING PART STRUCTURE

Prefix X	Product Type XX	Density XX	Technology XX	Form Factor XX	Casing X
F–Channel	TM–SATA-III MLC	28-128GB	S3-SuperNova SATA III	25–2.5”	H–Metal Case
		56-256GB			
		12-512GB			

Table 1: Ordering Part Structure

2.2 VALID ORDERING PART NUMBERS

Product Family	Capacity	Flash	Form Factor	Casing	Super Talent Part Number
Super Nova	128GB	MLC	2.5”	Metal	FTM28S325H
	256GB	MLC	2.5”	Metal	FTM56S325H
	512GB	MLC	2.5”	Metal	FTM12S325H

Table 2: Valid Ordering Part Numbers

3.0 PHYSICAL SPECIFICATIONS

Length: 100.0 ± 0.25 mm

Width: 69.85 ± 0.25 mm

Thickness: 7.00 ± 0.25 mm

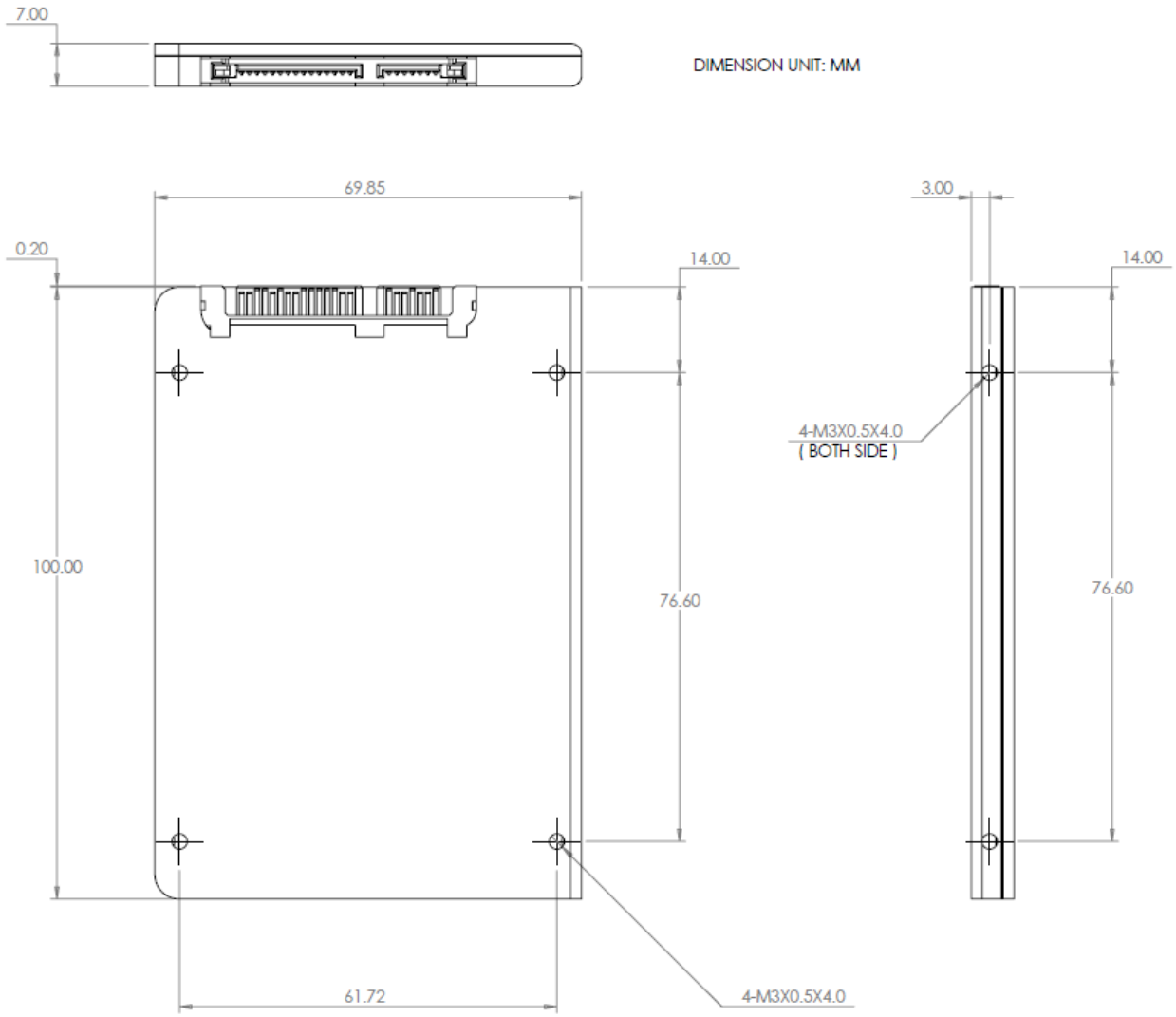

Figure 1: 2.5" SSD Outline Drawing

4.0 ELECTRICAL SPECIFICATIONS

Operating Voltage: V_{cc} = 5.0V ±10%

Sector Size: 512Bytes

4.1 PERFORMANCE SPECIFICATIONS

Access Time: 0.1 ms

Seek Time: 0 ms

Mount Time: Dependent on system HW and SW

Read Latency: 30 µs (Typical) **Write Latency:** 40 µs (Typical)

Power Consumption (Read) 0.82W – Active 0.26W – Idle/Standby/Sleep

Power on to Ready: 0.5 seconds (Max)

Data Transfer Time: Rated Data Transfer Speeds are maximums based on ATTO benchmarking result and IO Meter 2008 RC2. (For the best performance, QD=16 or 32 setting is required)

Device	Sequential Read Max (MB/Sec)	Sequential Write Max (MB/Sec)	Random Write 4KB IOPS
FTM28S325H	540	520	Up to 85K
FTM56S325H	540	520	Up to 85K
FTM12S325H	tbd	tbd	tbd

Table 3: Data Transfer Time Specifications

Performance is highly dependent upon test environment and test specifications. Consult our benchmarking data for more detailed performance information or benchmark performance in your environment.

4.2 ABSOLUTE MAXIMUM RATINGS

Symbol	Rating	Value	Unit
V_{cc}	Power Supply Voltage	-0.5 to 6.5	V
V_{IN}	Input Voltage	-0.5 to Vcc+0.5	V
T_{STG}	Storage Temperature	-55 to 115	°C
T_{OPR}	Operating Temperature	0 to 70	°C

Table 4: Absolute Maximum Ratings

5.0 ENVIRONMENTAL SPECIFICATIONS

Operating Temperature: Commercial Temp Range Only

- Commercial 0°C to 70°C

Humidity: 5% to ~98% RH

Operating Shock: 1500G

Operating Vibration: 16G

Operating Altitude: 120,000ft

6.0 QUALITY / RELIABILITY AND SECURITY SPECIFICATIONS

Data Retention: Up to 10 years

Wear Leveling: Superior wear-leveling

Security: Data Encryption. 128-bit AES-compliant (TCG Enterprise and Opal(Client))

Bad Block Management: Drive will self identify bad blocks and remap physical to logical addresses to avoid bad blocks.

ECC/EDC (Error Correction Code/Error Detection Code): Built in error detection and correction will correct physical bit errors in NAND. 55BCH.

MTBF: >1,200,000 hours

Unrecovarable Data Error: 1 error in 10^{15} bits transfer

Power Cycle: TBD

Note: MTBF and FIT Rate calculated based on component values

Security: Integrity Data Security
Automatically stores data in a secure, AES-128 encrypted format. This also prevents would-be thieves from extracting data directly from the flash memory should they ever have access to the drive.

7.0 COMPLIANCE SPECIFICATIONS

All TeraNova drives are compliant with the following standards and regulations:

- RoHS

8.0 PIN DESCRIPTIONS

8.1 DATA PIN ASSIGNMENTS

Pin	Symbol	Description
S1	GND	
S2	RxP	Differential Signal Pair for Receiver
S3	RxN	Differential Signal Pair for Receiver
S4	GND	
S5	TxN	Differential Signal Pair for Transceiver
S6	TxP	Differential Signal Pair for Transceiver
S7	GND	

Table 5: Data Pin Signal Assignment

8.2 POWER PIN ASSIGNMENTS

Pin	Symbol	Description
P1	Not Used (3.3V)	N/A
P2	Not Used (3.3V)	N/A
P3	Not Used (3.3V Precharge)	
P4	GND	1st mate
P5	GND	2nd mate
P6	GND	
P7	5V Precharge	5V Power
P8	5V Precharge	5V Power
P9	5V Precharge	
P10	GND	
P11	Reserved	
P12	GND	1st mate
P13	Not Used (12V Precharge)	N/A
P14	Not Used (12V)	
P15	Not Used (12V)	

Table 6: Power Pin Signal Assignment

9.0 INSTALLATION

BEFORE GETTING STARTED

1. Back Up Your Data

VISUAL INSPECTION

1. Before unpacking and handling the SSD, discharge the static electricity by touching the metal chassis of your computer or by using an anti-static wrist strap
2. Inspect the box and device for the following
    a. Box is damaged or water-stained
    b. Any damage to the SSD

HANDLING THE SSD

1. Be cautious when unpacking, installing, and handling the SSD drive. Misuse of the SSD voids all warranty. Follow the succeeding instructions when managing the SSD
2. Follow all ESD pre-cautions
3. Always operate the SSD within environmental conditions
4. Never switch DC power to the drive by plugging an electrically live source cable into the drive's power connector
5. Ensure correct cable polarity whenever connecting the drive to the cable

INSTALLATION

System Requirements

To install the SSD in your computer, ensure that you have the following items:

1. Mounting Screws
2. SATA data and power cable (Sold separately)

Install the SSD

Follow these steps to install the SSD

1. Power down the PC
2. Remove the computer system outside cover
3. Connect a cable between the SSD and host
4. Replace the PC cover
5. Power on the PC

6. A BIOS sign-on message appears and displays a key sequence to enter the BIOS setup. Set up the BIOS to recognize the SSD.

USING THE SSD IN A MS-DOS OS

The SSD is already partitioned and formatted by NTFS, so if you want to install MS-DOS O/S on the SSD, it should be re-partitioned and re-formatted. After installing the SSD, it must be installed as a disk drive under DOS. Run the DOS commands as listed below and follow the instructions displayed for each command.

1. Run the DOS FDISK program to partition the SSD
2. Verify that the partition is active and ready for formatting
3. Run the DOS FORMAT command to high-level format the SSD

USING THE SSD IN A WINDOWS OS

No modifications need to be made to use the SSD in a Windows OS platform

USING THE SSD IN APPLE MAC OS

No modifications need to be made to use the SSD in a Windows OS platform

Just follow the steps stated in the APPLE Manual.

BOOT camp for Windows OS is verified. VMWare is also verified.

USING THE SSD IN A LINUX O/S

No modifications need to be made to use the SSD in a Linux OS platform

USING THE SSD IN OTHER O/S

No modifications need to be made to use the SSD in other OS platforms

FOR MORE INFORMATION

For Technical Support:

If additional support is needed, please visit the Super Talent Web site at www.supertalent.com for the following topics:

- **Warranty Services:** Includes the warranty service policy and the RMA request forms.
- **Technical Information:** Includes product data sheets and various SSD whitepapers.
- **Tools Section:** Includes frequently asked questions (FAQs).

For More Information or Further Technical Support Please Contact:

Super Talent Technology
2077 North Capitol Avenue
San Jose, CA 95132
USA
Tel: +1 (408) 934-2560
Support: Support@supertalent.com
Sales: Sales@supertalent.com
OEM Sales: OEMSales@supertalent.com

CHANGE RECORD

Version	Release Date	Changes
1.1	July 25, 2012	Initial Release

Table 7: Change Record